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ABSTRACT

The extent to which the classroom evaluation practice of secondary school teachers is of a formative nature and the effects of any formative evaluation on student learning were studied through semi-structured interviews with 54 teachers in 5 Dutch secondary schools. All taught secondary Dutch or mathematics. In addition, 557 students completed questionnaires about the evaluation practices their teachers used in teacher-made written tests. It was strikingly evident that the evaluation practice of all the teachers could be considered summative in nature. All the written tests were given a grade that counted toward the final mark at the end of the school year. Teachers in this sample never gave a written test without assigning a grade. Some of the evaluation practices were formative in that some teachers, those with a solution-oriented (27 teachers) or process-oriented (20 teachers) evaluation practice, organized classroom discussions of the tests. These were the teachers who created the most learning opportunities for students. Seventeen of 27 teachers with a solution-oriented approach taught mathematics, while 13 of the 20 teachers with a process-oriented evaluation approach taught Dutch. These results suggest that actual evaluation practice is contextualized. (Contains 5 figures and 39 references.) (SLD)

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FORMATIVE EVALUATION RECONSIDERED:

Secondary School Teachers' Evaluation Practice as a Learning Opportunity for Students

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FORMATIVE EVALUATION RECONSIDERED: Secondary School Teachers' Evaluation Practice as a Learning Opportunity for Students

Elke Struyf, Roland Vandenberghe & Willy Lens

"Despite the elusive and complex nature of teaching, research on teaching should continue with the hope we can better understand it." (Ornstein, 1991, p. 64)

Introduction

This paper is part of a larger research project about the determinants and effects of the evaluation practice of secondary school teachers on students' motivation and learning strategies (Struyf, Waeytens, Vandenberghe & Lens, 1995a). In this paper we only discuss the impact of "formative evaluation".

The major research questions are:

- *To what extend is the classroom evaluation practice of secondary school teachers of a "formative" nature?*
- *Does the (formative) evaluation practice create a powerful learning environment for students?*
- *Does the (formative) evaluation practice has an impact on the motivation and learning of students?*

In a first section, we present the theoretical background and framework. Then we briefly describe the research methodology. The main part of the paper consists of the presentation of the major findings.

Background and theoretical framework

Formative and summative evaluation

Evaluation of students is considered as "an essential feature of good learning and teaching". (Black, 1995, p. 268). In the literature on teaching and evaluation, "formative evaluation" has become a widely used concept.

The concept refers to a set of evaluation activities that takes place during the teaching-learning process. The aim of formative evaluation is a better understanding of the learning process in order to "improve students' learning, (that is) to discover strengths and weaknessess in learning and to make midcourse corrections in pace or content of instruction" (Slavin, 1988, p. 547). Through formative evaluation a teacher can identify areas where students need more explanation and guidance (Butterfield, 1990). Crucial in this regard is "the ongoing feedback to the teacher and the student regarding success and failure" (Dembo, 1994, p. 553). Not only the teacher but also the students receive feedback about their actual learning (Kyriacou, 1993). Given this feedback, students are able to correct their mistakes and to avoid the same mistakes in future evaluation tasks.

Very often formative evaluation is contrasted to "summative evaluation", referring to the evaluation that typically comes at the end of a teaching period (Kourilsky & Quaranta, 1987). At the end of a learning or teaching period, the teacher wants to judge whether students achieved the premised learning objectives. The main purpose of summative evaluation is grading or the certification of student achievement (Dembo, 1994).

We agree with Gipps (1994, p. 125) when she states that "the key difference between formative and summative assessment is not timing, but *purpose* and *effect*". Recently literature about classroom evaluation pays a lot of attention to the impact of teachers' evaluation practice on the motivation and learning of students. A commonly held view is that - if it is used properly - assessment can motivate students and contribute to their learning (Butterfield, 1990; Dockrell, 1995; Gipps, 1994). Experimental studies revealed that different aspects of the assessment procedure are crucial in this respect, e.g. the (kind of) feedback that is given to students about their performance, the expectations that are created on what will be evaluated and how it will be done, etc. (Bangert-Drowns, Kulik, Kulik & Morgan, 1991; Butler & Nisan, 1986; Crooks, 1988; Deci & Ryan, 1986). *Formative* evaluation is often mentioned as the form of assessment that contributes to *motivational and learning effects* on students (Conner, 1991; Findlay, 1991; Harlen & James, 1996).

Goal orientation and level of processing

Following the recent shift in motivational literature towards a goal theory of motivation, we use the concepts 'task orientation' versus 'performance orientation' as indications for the motivation of students (Ames, 1992; Elliot & Dweck, 1988; Maehr & Buck, 1993). A goal orientation refers to the goals toward which students are oriented when studying. 'Task oriented' students are primarily motivated to increase their knowledge and competencies. They want to improve and master challenging and new tasks. Errors are not perceived as failures but as learning opportunities. When evaluating their level of performance, task oriented students use their earlier performances as an individual criterion.

'Performance oriented' students in contrast, are not motivated by the task as such. They mainly want to show to others and to themselves how able they are. Their first concern is getting high grades. Errors are perceived as failures and as a sign of lack of ability. Performance oriented students use the performance of other classmates to evaluate their own learning outcomes. Success means to be better than others.

The TARGET[1] model of Ames (1992) gives indications that the goal orientation of students is influenced by the teachers' evaluation practice and the feedback students get.

As an indication for the learning effects, we use the concepts 'deep level' and 'surface level' of cognitive processing (Marton & Säljö, 1976a; 1976b). Students who make use of a deep level of processing, approach the learning material in an active manner. They try to understand the course material and, to achieve this goal, they use a diversity of cognitive and metacognitive learning strategies. Students who use a surface level of processing have a reproductive conception of learning which means that they are more or less forced to use a rote-learning rehearsal strategy. They consider the course material as an accumulation of facts that can not be integrated. They try to finish their tasks as quick and with as little effort as possible. (Struyf, Waeytens, Vandenberghe & Lens, 1994)

Several studies indicate a clear relationship between students' goal orientation and the use of learning strategies for managing classroom academic tasks (Meece & Holt, 1993; Nolen & Haladyna, 1990; Pintrich, 1989; Pintrich & Schrauben, 1992; Struyf, Waeytens, Vandenberghe & Lens, 1995b). Task oriented students seem to handle a deep level approach to learning, while performance oriented students rather use a surface level of processing. Both goal orientation and level of processing are found to be related to school results (Svensson, 1977). Task oriented students and students who process the learning material in a deep level, usually get higher grades.

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[1] Ames describes six areas that relate to a task orientation: Task, Authority, Recognition and reward, Grouping, Evaluation and Time. The TARGET structures provide a framework for integrating specific motivational strategies that are consistent with a task orientation - or a mastery goal orientation - and for applying achievement goal theory to classroom processes.

The formative and summative nature of the evaluation through teacher-made written tests

However, although the concept of formative evaluation is widespread, its implementation in the daily teaching practice is less evident. In our study we focus on one particular form of classroom evaluation: the evaluation of students *during* the school year through *teacher-made written tests*[2].

The evaluation of students by means of written tests is considered as a process that consists of four phases (see Figure 1).

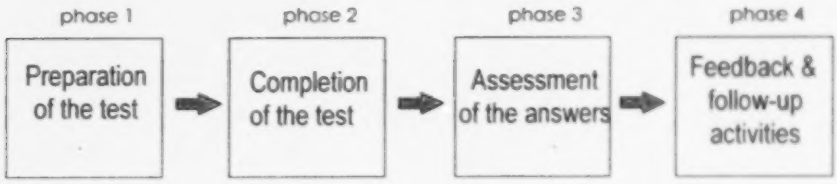

Figure 1
The evaluation of students through teacher-made written test

First there is *the preparation phase* (phase 1): the teacher develops questions. The preparation phase is followed by *the completion of the test* (phase 2). The students take the test and answer the questions. After the *answers* are *corrected and assessed* (phase 3), the teacher gives *feedback* and organizes *follow-up activities*, e.g. a class discussion or individual coaching (phase 4).

In order to characterize the evaluation practice as more or less formative, we focus on *the feedback and follow-up activities* (see Figure 2). Feedback and especially follow-up activities are considered as typically formative because they create opportunities for future learning (contrary to summative evaluation where follow-up activities are not organized).

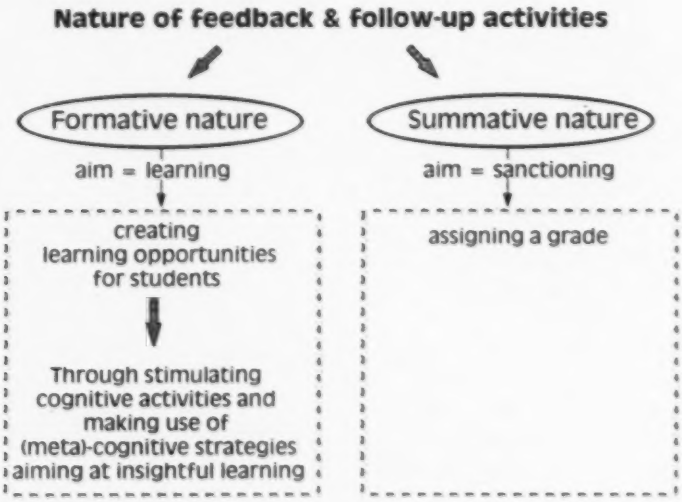
Nature of feedback & follow-up activities
Formative nature
aim = learning
creating learning opportunities for students
Through stimulating cognitive activities and making use of (meta)-cognitive strategies aiming at insightful learning
Summative nature
aim = sanctioning
assigning a grade

Figure 2
Phase 4: the nature of feedback and follow-up activities

[2] We are *not* studying the final exams organized at the end of a tri(se)mester or at the end of a school year. This form of evaluation is often characterized as summative. Nor are we looking at more *informal* forms of evaluation such as the observation of students or asking questions during the teaching process. These more informal forms of evaluation are often characterized as formative.

We assume that by giving *descriptive* feedback (Tunstall & Gipps, 1996) - not just a grade - and organizing follow-up activities *in a particular way*, a teacher can create learning opportunities for students. In order to promote effective future learning, it is necessary that a powerful learning environment (De Corte, in press) is created after the correction and assessment of the answers.

This means that the activities organized by the teacher have to be oriented towards real understanding of the tested subject content. Students have to reach insight in the correct and wrong answers. *Insightful* learning can be attained by stimulating students to *actively engage* in the follow-up activities and to make use of *(meta)-cognitive strategies*. An evaluation with a high formative nature must meet these three conditions (insightful learning - active learning - using (meta)-cognitive strategies) and pursue maximum learning from the test.

When the evaluation is merely done to judge the students' knowledge and assign a grade, the summative nature of the evaluation is high. Especially when success or failure at the *end* of the school year is depending on the grades obtained on the written test *during* the school year, 'getting a high grade' becomes extremely important. In that case the sanctioning aim of the test is emphasized.

By referring to a summative and formative 'nature' of teacher-made written tests, we consider the concepts 'formative' and 'summative' in a slightly different way. In the literature it is not always clear how the two concepts relate to each other, e.g. whether a formative type of evaluation - with a formative 'maximum-learning' purpose - excludes a summative 'sanctioning' or 'grading' purpose. By referring to the 'nature' of a teacher-made test we assume both purposes can be combined in one and the same evaluation moment. Depending on which purpose is more emphasized, a written test is becoming more or less formative (or more or less summative).

In order to characterize an evaluation practice as more or less formative we look at *what teachers do* after the completion of the test; whether or not any learning activities are organized by the teacher. While the evaluative behavior is influenced by teachers' cognitions - such as their opinion about evaluation in general - (Jiménez, 1986; Lissmann, 1989; Verloop & van der Schroot, 1995), we also gathered information regarding the teachers' intentions, i.e. the reasons why they behave in a particular way.

Research methodology

Data about the actual evaluation practice were collected through semi-structured interviews from 54 teachers in 5 different secondary schools. All teachers teach Dutch or mathematics in grades 1, 2, 5 or 6 of secondary education. The interview consisted of two kinds of questions. On the one hand we asked the teachers to describe their evaluation practice in detail ('What do you do?'); on the other hand we tried to gain a clear understanding of the reasons for their actions ('Why are you doing this?' 'What are you trying to achieve?'). In addition, we explored the teachers' evaluation practice using a questionnaire for their students: 557 students filled out the written questionnaire. We asked students about specific teacher behavior ("The teacher...") and about their opinion regarding this behavior ("I think...").

In combining these two sets of data, a rich description is obtained of the teachers' evaluation practice in the classroom through teacher-made written tests.

Information about the goal orientation (task orientation vs. performance orientation) and level of processing (deep level vs. surface level approach) of the students was also gathered by means of a questionnaire.

We used qualitative data analysis techniques to analyse the interview data. After coding the interview material, the data were displayed by means of matrices in order to draw conclusions (Miles & Huberman, 1994).

Results

In this paper the results of the *qualitative* analysis are described. Results of the quantitative analysis are presented elsewhere (Struyf, Waeytens, Vandenberghe & Lens, 1995b).

- **The summative nature of the evaluation by teacher-made written tests**

One extremely striking conclusion is that the evaluation practice of all the teachers can be considered as more or less summative. All teachers indicate that all their written tests are provided with a grade that counts partly for the final mark at the end of the school year. Teachers never give a written test without assigning a grade.

To what extent the grade counts for the final mark, is depending on the school policy. In some schools the results of the teacher-made written tests during the school year count for almost 50% in the final grade at the end of the school year. In other schools the results of the teacher-made written tests during the school year count for less, 25% or 30% to 40%. The grade students achieve on the final examination becomes more important for succeeding or failing at the end of the course.

Because of the fact that passing or failing at the end of the school year is (more or less) depending on the grades of the written tests during the school year, the *sanctioning function* of these tests is highlighted.

- **The formative nature of the evaluation by teacher-made written tests**

Description of the different evalution practices

Focusing on the feedback and follow-up activities of teachers (what teachers *do*), we found different types of evaluation practices, each of wich can be located on a different position on the formative continuüm (from less to more formative - see next section: Figure 4). We then verified whether teachers with a different evaluation practice think differently about evaluation and its purpose.

The judgement-oriented evaluation practice

A small group of seven[3] teachers report that they usually don not organize a classroom discussion after the completion of the test. After the correction and assessment of the answers, students simply get their test papers back so they can see how they have performed on the test. As said earlier, each test is always provided with a grade.

> *I organize a lot of tests - and so I loose already a lot of time. Then, when I give back the test papers, sometimes they want to ask questions... If I have to answer all the questions... that is simply impossible. (T43M2)*[4]

Only in extreme situations - *'when almost nobody has answered the question correctly' (T35M6)'* or *'when I notice that something is not understood by 70% of my students' (T49D1)* - the teachers will look at the test or at a particular question.

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[3] Three teachers teach Dutch: two of them in the first or second grade, one in the fifth grade. Four teachers teach mathematics: one in in second grade, three in the fifth or sixth grade.

[4] Each interview fragment is followed by a code that indicates the number of the teacher (e.g. T43), the subject he/she teaches (M = mathematics, D = Dutch) and the grade (1, 2, 5 or 6).

Another striking conclusion is that none of these teachers report that they are not used to organize themselves individual coaching activities. If students think they need more explanation or support, they have to take the initiative themselves to talk to the teacher.

> *If they have questions, or if they want to know something, then they just have to ask. Students can always come after my teaching period. That is no problem at all. (T48M6)*

The teachers also do not oblige students to correct their mistakes on the test. It takes too much valuable teaching time to ask this from the students.

> *I really think it is a good thing that students correct their mistakes, but in the classroom... then you loose far too much time. (T43M2)*

Some teachers stimulate students to do this at home, but they do not control this. It is the students' own responsibility.

> *If he wants to correct his mistakes, then he is free to do so, that is his initiative. (T48M6)*

Because these teachers do not organize any learning activities after the completion or the correction and assessment of the test, the evaluation practice cannot be characterized as formative. Although, these teachers do refer to a formative *purpose*: written tests provide the students with information about their learning process and about problems in the learning content they do not yet fully comprehend. The teachers take the view that given this information students are able to learn from their mistakes and avoid making the same mistakes again.

> *When they look at the tests, they know: 'this was not so good', 'I should look at that chapter again.' That is in fact the intention... But what they really do, that remains the question... (...) But they see when they look at their grades: 'Yes, I know it' or 'No, I don't.' (T43M2)*

Noticable is that these teachers make *the students themselves* responsible for their own learning process. The teachers point out that students are old enough to carry this responsibility.

> *I give them responsibility. I'm not going to hold their hands all the time - no - they have to learn to do things on their own. They are in their second year, you know. (T49D1)*

<u>*The solution-oriented evaluation practice*</u>

A group of 27 teachers[5] report that they mostly discuss the test questions in the classroom, just after the test has been taken by the students or after the correction and assessment of the test. The classroom discussion mainly consists of giving the correct answers to the questions.

> *Sometimes this happens immediately after the test has been taken. The students handle over their test papers, the questions are still written on the blackboard - and when you have only 15 minutes time left... Then I say: 'Kids, what's the answer to the first question?' They give the answers and I write them on the blackboard. (T21M1)*

For these teachers it is important that students know the correct answers. Because of that, it is not *always necessary* to discuss *all* the questions. Teachers report they do not discuss questions when

[5] Six of these teachers teach Dutch in the first or second grade; four teach Dutch in the fifth or sixth grade. Nine teachers teach math in the first or second grade and eight teachers teach math in the fifth or sixth grade. Notice that 17 of the 27 teachers teach mathematices and 10 teachers teach Dutch.

students themselves can find the correct answers in their textbook or when almost everybody answered that question correctly.

> *When the test is so self-evident that the correct solutions can be found in the textbook, then a classroom discussion is not necessary. But when the test consists of new exercises, then there's a discussion. (T2M1)*

Whether students really gain insight in the content, that is in fact their own responsibility. The classroom discussion is restricted to providing the right answers.

> *Very often I solve the questions on the blackboard... so that students can see for themselves what went wrong; students can assess themselves in a way. (...) When the correct solution is on the blackboard, they can clearly see what they did wrong. (T47M6)*

A few teachers (n = 11) emphasize that students have the opportunity to ask questions after the correct answer is given. When something is not entirely clear, students can ask the teacher for more clarification.

> *Immediately after the completion of the test I give the correct answers. The students must at least know the correct answers. And that's it. Of course, they can always ask me things, like for instance: 'Why is my answer wrong?' When I give back the corrected test papers and if someone has doubts about his answer, he can always ask me... but normally I don't discuss the answers again, unless students ask me to do this. (T4M6)*

Only a limited number of teachers (n = 4) will actually stimulate students to ask for more explanation.

> *And then I say sometimes: 'Ask me whatever you want if something is not clear'. And then I wander around the classroom... "Miss, that is something I still don't understand, why have you underlined this?" So I write the answers on the blackboard and then they must take the initiative to ask me things. (T34M6)*

While most of the teachers expect the students to take notes during the classroom discussion (writing the correct answer on the test paper), they do not really control if students follow this advise.

> *In principle they should do that, but I must admit that I don't verify it. I think - especially for students of a sixth grade - that is their own responsibility. (...) Someone who finds his answer acceptable, don't take notes. When someone thinks he can use it, he does. (T54D6)*

In case of an overall weak classroom result, the teacher will explain the subject matter again.

> *When I notice that a lot of mistakes are made, that they really don't understand the subject matter satisfactorily, in that case, you should teach the lesson again. (T18D1)*

About half of the teachers report that afterwards they will organize a new test on the same subject matter.

Individual follow-up activities are not often organized. Students themselves must take the initiative to adress to the teachers (cf. a judgement oriented evaluation practice).

> *I think students themselves must undertake action at that moment. (...) They know I arrive at school every morning at 8 o'clock and they can come to see me between 8.00 and 8.30*

a.m. Or they can make an appointment during breaks. They know that. I tell that at the beginning of the school year. They have the opportunity to consult me. (T4M6)

Only a few teachers will encourage students who obtained low marks to make extra exercices or study the subject material again.

Some teachers report they coach students after the regular teaching periods or they give extra lessons during breaks. Students are free to join these sessions.

These lesson normally take place during the lunch break. I tell students to come or they can freely join the group. (T39D1)

As an answer to why they act in that particular way, these teachers also mention the formative function of teacher-made written tests. The written test gives to students *and* teachers information about the learning process that took place and the results. Contrary to the teachers with a judgement-oriented evaluation practice, these teachers point out *their own responsibility* in optimalizing the learning process. They stress it is one of their tasks to organize activities so that the learning process improves.

The aim of the written tests is mainly to oblige students to learn their lessons every day. It's also for myself because - although students learn their lessons - this not always means that students actually understand everything. And it don't make sense to continue, if students don't understand the content. That's why I organize written tests. (T16M6)

I think we are here to help students. So you'll have to find out what they don't understand. Otherwise you can't help them. (T21M1)

Many (n = 21) of these teachers also underline the fact that written tests can be useful for the future exams at the end of a tri(se)mester or at the end of the school year. Students should avoid making the same mistakes. Teacher-made written tests during the school year illustrate for the students potential examination questions and the classroom discussions provide students with the correct answers.

I hope they use the written tests when they prepare their examination. I hope that they look at their mistakes... see what they did wrong. (T53D6)

A written test is never a final test. At the end of a trimester they always get another evaluation on the same subject matter. So if they get something out of it, that's always good. (...) WHY DO YOU ALWAYS RETURN THE WRITTEN TESTS TO THE STUDENTS? First students have to store the tests, so that if they have to study the same subject matter again - for instance for the final examination - they have a additional tool to study. They can look at the tests again, thay can see what kind of questions I asked, what they did wrong... So that they don't make the same mistakes again. (T24M6)

<u>*The process-oriented evaluation practice*</u>

This group of 20 teachers[6] also organize a classroom discussion after the test. During the classroom discussion the answers of students are commented. Special attention is given to the cognitive strategies leading to the answers: students must understand why a certain answer is correct and

[6] Six of these teachers teach Dutch in the first or second grade; seven teach Dutch in the fifth or sixth grade. Five teachers teach math in the first or second grade and only two teachers teach math in the fifth or sixth grade. Notice that 13 of the 20 teachers teach Dutch and only 7 teachers teach mathematics.

another one wrong. The classroom discussion is not limited to providing the solutions, more important is the 'reasoning' behind the correct answers and the mistakes. Organising the classroom discussion in such manner creates learning opportunities for students to gain more insight in the subject matter.

> *I for instance say what they forgot to mention, what should have been there as an answer. (...) During the discussion I really try to explain how they should have answered the question, what mistakes are made. So I give more general remarks; what is missing in the answers or why certain questions are answered incorrectly.(..) They have to learn to avoid making the same mistakes again. They have to learn how they could formulate a better answer. (T29D6)*

> *After taking the test, we will answer the questions together, so that each student really sees: 'These are the correct anwers. There I went wrong. Why did I made that mistake?' That is something I always try to explain: 'Look, there you made a mistake. How could you have found the correct answer?' So they gain insight in their wrong way of reasoning. That is something I find very important. (...) I always write the answers down on the blackboard, but it is a student who gives the answer. And then I ask: 'Look boy, there you were wrong.' (T51D1)*

Some teachers indicate they prefer discussing the answers themselves, others stress that it is better to let the students comment their own answers.

Most of the teachers indicate that they expect students to take notes during the discussion, but they will seldom verify it.

> *They have to correct their mistakes, because otherwise they have heard it once but they forget it. The correct answer must be written on the test paper. IS THAT DURING LESSON TIME? Yes, so they really learn from their mistakes. Or that should be the case. (T9D1)*

> *Sometimes you really have to oblige students to note the remarks given during the classroom discussion, because some students think: 'Ah, the test is done - I got my mark - that's enough for me.' That is also the case with the exams for instance: 'The exam is passed. So I don't have to write anything down anymore that concerns that subject matter.' DO YOU VERIFY IF STUDENTS TAKE NOTES? No. That is their business. That is like how they organize their studies: you give them everything: the learning material, the learning tools and then... is it up to them. (T29D6)*

When they ascertain that most of the students did not perform well on the test, most of the teachers will explain the subject matter again. Some teachers also report that they make extra exercises in the classroom.

> *When many students fail the test, I'll pay extra attention to the classroom discussion. Sometimes I make extra exercices on that particular subject matter that seems to be not entirely understood. (T31M1)*

Often a new test will follow.

> *If that is the case, I will once more briefly teach the lesson. But first I will ask the students to learn everything again and mark the things they do not fully understand. And those things I will explain again during the lesson. And it's possible that I'll organize another test that same lesson. So they get a second chance. (T17D1)*

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The teachers also indicate that they coach individual students. Sometimes this individual coaching takes place during the teaching periods.

> *I can also differentiate during the lesson: those students who scored six or more on the test, they make some more exercices, more difficult ones. The other students who scored less than six, must pay attention to me. We make the same exercices and I explain it again. (T17D1)*

When a teacher gives further explanation after the teaching periods, students are free to join these classes.

> *In general I will say: 'I'm not going to repeat this now, but if you want I will explain it again during the lunch break.' Those who are not interested, will not come. And then I once again try to explain the subject matter or I discuss all the test questions in depth. (T46M6)*

Besides the individual coaching activities organized by the teacher, students always have the opportunity to ask for additional explanation. Some teachers actually stimulate the students to do that.

> *Sometimes I go to a particular student and explain why his aswer is wrong: 'You write that, but that's not correct. You make a mistake there. Are you aware of that or not? If you don't see your mistake, come and see me this afternoon.' (T52D6)*

Few teachers will also motivate students to do extra exercises on the subject matter or to rehearse the subject matter once again.

> *It is also possible that I give some more exercices to particular students. And I always stress that those exercices are not given as a sort of punishment, but as a aid to help them. (T31M1)*

When we asked the teachers why they organize written tests and why they organize a classroom discussion, they refer to the formative function of the tests (cf. teachers with a judgement-oriented or solution-oriented evaluation practice). Students as well as teachers gain information about the learning process. What matters is that students learn something more from the tests.

> *They have to learn from their mistakes. I always say to my students: 'You're allowed to make mistakes as long as you learn from them!' When they understand why they have made a mistake, then there's a real chance that next time they will do it in another way and will not make the same mistakes again. So I think a classroom discussion is extremely important. (T51D1)*

> *It's important that students know what they did wrong: 'Look, that is a mistake. Why is that wrong? What is the correct answer?' I hope they learn from their mistakes. They don't just have to know whether they performed good or bad on the test. They have to know where they performed less and what they can do about it. (T9D1)*

By organizing a classroom discussion and follow-up activities teachers try to achieve this formative goal.

Comparison of the formative nature of the three evaluation practices
Figure 3 represents the main characteristics of the different evaluation practices.

Judgement-oriented	**Solution-oriented**	**Process-oriented**
Follow-up activities: •no discussion afterwards	Follow-up activities: •the discussion is focused on the correct answer	Follow-up activities: •the discussion is focused on the 'thinking process' behind correct and wrong answers
•follow-up activities: only in a few cases	•follow-up activities: in the classroom	•follow-up activities: in the classroom + individual coaching
Legitimation: •'students are responsible for their learning activities'	Legitimation: •'students must know the correct answers in order to improve their results on the next test'	Legitimation: •'students must understand and learn from their mistakes'

Figure 3
Main characteristics of the different evaluation practices

In order to characterize the follow-up activity (e.g. a classroom discussion) as formative or as a powerful learning environment , three conditions must be fulfilled (see also Figure 2):

- students must be actively engaged - i.e. cognitively involved - in the follow-up activity;
- students must become familiar with a variety of cognitive and metacognitive strategies to solve problems (e.g. test questions);
- so they really gain insight in the subject matter.

To what extend can we define the different secondary school teachers' evaluation practices as formative?

Because teachers with a ***judgement-oriented evaluation practice*** do not usually organize a classroom discussion after the completion of the test and because they only organize follow-up activities in exceptional cases, their evaluation practice hardly can be characterized as formative. Although the teachers refer to a potential formative purpose of the written tests, students themselves are responsible for their own learning.

Both the other groups of teachers - those with a ***solution-oriented or a process-oriented evaluation practice*** - report they organize a classroom discussion. But they are aiming different purposes: the main goal of solution-oriented teachers is providing the correct answers; the main goal of the process-oriented teachers is reaching insight in the cognitive processes behind the correct and wrong answers. Through providing the correct answer it is *possible* that some students reach insight in their mistakes, but certainly not self-evident. It is not because correct answers are given (by the teacher or the students) that a *cognitive* activity has taken place. In contrast, when exploring the cognitive processes underlying the solution - like the process-oriented teachers try to do - the chance is real that insight is reached. There is a fair chance that students are *cognitively engaged* in the classroom discussion, when the teacher asks students to comment their answers themselves.

Remarkable is that none of the teachers we interviewed pay attention to the use of general cognitive and meta-cognitive strategies. The classroom discussion of a process-oriented evaluation practice is

also mainly oriented towards insight in the specific subject matter. We did not get any indication that teachers learn students how to handle (meta-)cognitive strategies apart from the tested subject matter.

Some teachers do refer to the use of (meta-)cognitive strategies when preparing students for the test. They for instance point out to students the benefits of carefully planning their work or stimulate students to anticipate possible test questions and gear their study activities to those questions. Other teachers refer to (meta-)cognitive strategies when students are taking the test. They advise students to read the questions attentively before answering them or to double-check their answers before turning in their test paper. Teachers usually seem to *tell* students what strategies they can use without actually *learning* how to implement them. Most of the time students get general hints of limited use. We found no indications that students are learned to use (meta-)cognitive strategies as a result of a test. One of the three conditions charactarizing a powerful learning environment remains unfulfilled.

Looking at our research data, we come to the conclusion that teachers with a process-oriented evaluation practice create most learning opportunities for students. This evaluation practice can thus be characterized as largely formative, although not all of the conditions characterizing a powerful learning environment were fulfilled (see Figure 4).

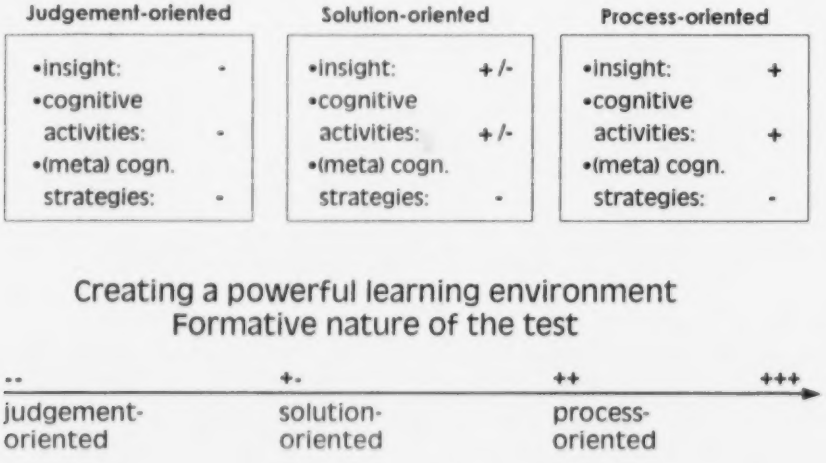

Figure 4
Formative nature of the different evaluation practices

Final remarks

Although most of the teachers explicitly refer to a formative function of the written tests, only the evaluation practice of some teachers can be characterisized as formative - i.e. the teachers with a process-oriented evaluation practice.

Teachers make students responsible for their own learning. Especially teachers with a judgement-oriented evaluation practice give high responsibility to the students. But also teachers with a solution-oriented or process-oriented evalution practice point this out: if something is not clear, students have to take the initiative to ask for further explanation. Of course the students themselves are responsible for the information processing, but a teacher can *support* this process (Boekaerts, 1985). This is done by teachers with a process-oriented evaluation practice.

Interesting is the finding that of the 27 teachers with a solution-oriented evaluation practice, 17 teachers teach mathematics, while of the 20 teachers with a process-oriented evaluation practice, 13

teach Dutch. These results suggest that the actual evalution practice is contextualized, this means linked with the subject the teacher teaches.

- **The impact of the evaluation practice of teachers on the motivation and learning of students**

Based on recent literature where formative evaluation is considered as contributing to motivational and learning effects on students (see Background and theoretical framework), we hypothesize that the evaluation practice with the most formative nature - the process-oriented evaluation practice - would have the most (positive) impact on the goal orientation and level of processing of students. An anova-statistical analysis however revealed no such direct effects on the goal orientation and level of processing of students.

This finding is in fact not very surprising. Knight and Waxman (1991, p. 239) notice that 'traditionally studies of classroom instruction have investigated the relationship between teacher behaviors and student achievement, assuming a direct relationship between the two.' Erickson (1986) criticizes this kind of process-product research[7] because it assumes one way causal connections between teaching and learning - that is, assuming that what a teacher does affects what students learn, without looking at mediated factors. Recently however the role of students' thought processes as mediaters between teaching and learning has been emphasized. According to Knight and Waxman (1991, p. 240, 241) 'the student mediating paradigm extends the teaching-learning connection assumed by the process-product paradigm by suggesting that the link is mediated by student cognitions and student perceptions.' Students selectively perceive and interpret classroom processes. Their interpretation of the situation determines their behavior (which may be covert or overt), which in turn influence achievement. Knight and Waxman (1991, p. 241) indicate: 'This mediation may explain certain inconsistencies in the findings of research studies on instruction. When students interpret instruction in a manner consistent with the intentions of the instructor, the relationship between instruction and student learning appears to be direct. However, when student interpretation and teacher intention do not match, the expected or desired outcomes are not achieved.' According to this interpretative view, any attempt to make causal connections between what a teacher does and what students learn will not be successful when mediated processen - like the students' cognitions - are totally ignored.
Findings from a student cognition approach of classroom instruction foster a more complex interpretation of teaching and learning that enhances the roles of the participants in the process.

Untill now, we did not collect any information about students' cognitions regarding the evaluation practice of teachers. The impact of the evaluation practice on students must therefore be explored further taking into account the students' cognitions. The following heuristic can be useful in explaining the impact of the evaluation practice on students.

[7] Process-product research on teaching studies the relations between teaching processes and what students learn (Needles and Gage, 1991, p. 4).

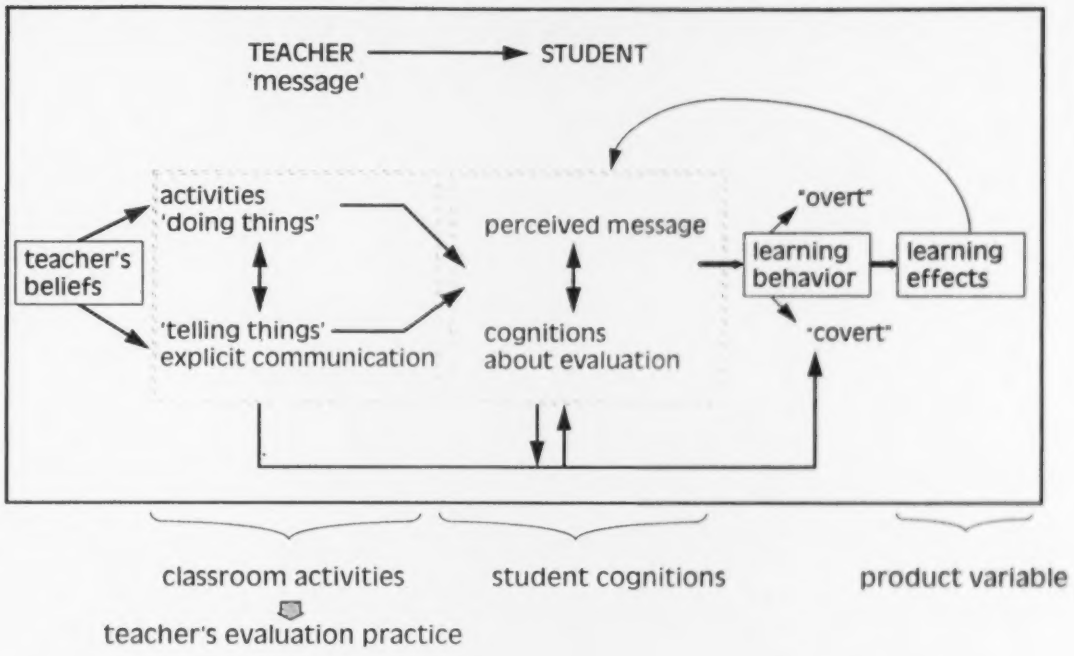

Figure 5
A heuristic to explain the impact of the evaluation practice of teachers on students.

By providing feedback (grades or descriptive feedback) and organizing - or not organizing - follow-up activities, teachers are sending 'messages' to students of what is regarded as important. Is a written test mainly aiming at sanctioning students (summative nature) or at additional learning (formative nature)?

The students *perceive* the evaluation practice of teachers. They perceive what goes on in the classroom - what the teacher does and what the teacher says about the evaluation. What students perceive is influenced by their own *cognitions* about the function (aim) of the evaluation through teacher-made written tests. Both students' perception and cognitions will have an influence on students' (overt and covert) behavior. This behavior in turn will lead to learning effects.

Further research will be undertaken to check the significance of these assumptions.

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